

Total No. of Questions : 4]

SEAT No. :

PC-35

[Total No. of Pages : 2

[6360]-35

**T.E. (Electrical Engineering) (Insem)**

**ELECTRICAL MACHINES - II**

**(2019 Pattern) (Semester - I) (303143)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates :*

- 1) *Solve Q1 or Q2, Q3 or Q4.*
- 2) *Neat Diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of electronic pocket calculator is allowed.*
- 5) *Assume suitable data if necessary.*

**Q1) a)** Why rotating field & stationary armature type of construction is preferred for 3-ph alternator. [7]

b) Calculate the no load emf of a star connected 3-ph , 6 pole alternator which is driven at 1200 rpm having flux per pole 0.12 Wb. The armature has 54 slots and double layer winding. Each coil has 10 turns & coil is short chordeed by two slots. [8]

OR

**Q2) a)** Draw the circuit diagram & explain the procedure to conduct slip test on salient pole 3-ph alternator to determine voltage regulation. Write the necessary formulae. [7]

b) A 3-ph, 1000 kVA 3300 V, 50Hz star connected salient pole generator has  $X_d = 1.9 \Omega$  &  $X_q = 1.4 \Omega$ . Find [8]

i) load angle  $\delta$

ii) voltage regulation at pf 0.8 lagging. Assume arm. Resistance  $R_a = 0$

**Q3) a)** Sketch the OCC and SCC of alternator & write down the steps to determination of voltage regulation of 3-ph alternator at lagging power factor by MMF method analytically. Assume  $R_a = 0$ . [7]

b) A 2000 kVA, 2300V, 3-ph star connected alternator has armature resistance of  $0.06 \Omega$  per phase. A field current 60 A, produces armature current of 600A and no load line emf of 900 V. Calculate (i) full load voltage regulation at 0.8 p.f lagging & (ii) power angle  $\delta$ . [8]

OR

**P.T.O.**

- Q4) a)** Define & explain the short circuit ratio using OCC & SCC plots. Comment on voltage regulation for (i) for higher value of SCR (ii) lower value of SCR. [7]
- b) Explain one dark and two equally bright lamp method of synchronizing of 3-ph alternators. Sketch the necessary circuit & phasor diagrams. [8]

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